CLAIMS:

1. A nucleic acid molecule comprising a nucleic acid sequence which encodes a polypeptide selected from any of:

(a) SEQ ID No: 2;

(b) SEQ ID No. 4;

(c) SEQ ID No. 6;

(d) an immunogenic fragment comprising at least 12 consecutive amino acids from a polypeptide of (a); and

(e) a polypeptide of any one of (a) to (d) which has been modified to improve its immunogenicity, wherein said modified polypeptide is at least 75% identical in amino acid sequence to the corresponding polypeptide of any one of (a) to (d).

2. A nucleic acid molecule comprising a nucleic acid sequence selected from any of:

(a) SEQ ID No: 1;

(b) SEQ ID No: 3;

(c) SEQ ID No: 5;

(d) a sequence which encodes a polypeptide encoded by any one of SEQ ID Nos: 1, 3 and 5;

(e) a sequence comprising at least 38 consecutive nucleotides from any one of the nucleic acid sequences of (a) to (d); and

(f) a sequence which encodes a polypeptide which is at least 75% identical in amino acid sequence to the polypeptides encoded by any one of SEQ ID Nos: 1, 3 and 5.

3. A nucleic acid molecule comprising a nucleic acid sequence which is anti-sense to the nucleic acid molecule of claim 1.

4. A nucleic acid molecule comprising a nucleic acid sequence which encodes a fusion protein, said fusion protein

comprising a polypeptide encoded by a nucleic acid molecule according to claim 1 and an additional polypeptide.

5. The nucleic acid molecule of claim 4 wherein the additional polypeptide is a heterologous signal peptide.

6. The nucleic acid molecule of claim 4 wherein the additional polypeptide has adjuvant activity.

7. The nucleic acid molecule according to claim 1, operatively linked to one or more expression control sequences.

8. A vaccine comprising at least one first nucleic acid according to claim 1, and a vaccine vector wherein each first nucleic acid is expressed as a polypeptide, the vaccine optionally comprising a second nucleic acid encoding an additional polypeptide which enhances the immune response to the polypeptide expressed by said first nucleic acid.

9. The vaccine of claim 8 wherein the second nucleic acid encodes an additional Chlamydia polypeptide.

10. A pharmaceutical composition comprising a nucleic acid according to claim 1 and a pharmaceutically acceptable carrier.

11. A pharmaceutical composition comprising a vaccine according to claim 8 and a pharmaceutically acceptable carrier.

12. A unicellular host transformed with the nucleic acid molecule of claim 7.

13. A nucleic acid probe of 5 to 100 nucleotides which hybridizes under stringent conditions to the nucleic acid

molecule of SEQ ID No: 1, or to a homolog or complementary or anti-sense sequence of said nucleic acid molecule.

14. A primer of 10 to 40 nucleotides which hybridizes under stringent conditions to the nucleic acid molecules of SEQ ID No: 1, or to a homolog or complementary or anti-sense sequence of said nucleic acid molecule.

15. A polypeptide comprising an amino acid sequence selected from any of:

(a) SEQ ID No: 2;

(b) SEQ ID No: 4;

(c) SEQ ID No: 6;

(d) an immunogenic fragment comprising at least 12 consecutive amino acids from a polypeptide of (a); and

(e) a polypeptide of any one of (a) to (d) which has been modified to improve its immunogenicity, wherein said modified polypeptide is at least 75% identical in amino acid sequence to the corresponding polypeptide of any one of (a) to (d).

16. A fusion polypeptide comprising the polypeptide of claim 15 and an additional polypeptide.

17. The fusion polypeptide of claim 16 wherein the additional polypeptide is a heterologous signal peptide.

18. The fusion protein of claim 16 wherein the additional polypeptide has adjuvant activity.

19. A method for producing a polypeptide of claim 15, comprising the step of culturing a unicellular host according to claim 12.

20. An antibody against the polypeptide of claim 15.

21. A vaccine comprising at least one first polypeptide according to claim 15 and a pharmaceutically acceptable carrier, optionally comprising a second polypeptide which enhances the immune response to the first polypeptide.

22. The vaccine of claim 21 wherein the second polypeptide comprises an additional Chlamydia polypeptide.

23. A pharmaceutical composition comprising a polypeptide according to claim 15 and a pharmaceutically acceptable carrier.

24. A pharmaceutical composition comprising a vaccine according to claim 21 and a pharmaceutically acceptable carrier.

25. A pharmaceutical composition comprising an antibody according to claim 20 and a pharmaceutically acceptable carrier.

26. A method for preventing or treating Chlamydia infection using the nucleic acid of claim 1.

27. A method for preventing or treating Chlamydia infection using the vaccine of claim 8.

28. A method for preventing or treating Chlamydia infection using the pharmaceutical composition of claim 10.

29. A method for preventing or treating Chlamydia infection using the polypeptide of claim 15.

30. A method for preventing or treating Chlamydia infection using the antibody of claim 20.

31. A method of detecting Chlamydia infection comprising the step of assaying a body fluid of a mammal to be tested with the nucleic acid of claim 1.

32. A method of detecting Chlamydia infection comprising the step of assaying a body fluid of a mammal to be tested with the polypeptide of claim 15.

33. A method of detecting Chlamydia infection comprising the step of assaying a body fluid of a mammal to be tested with the antibody of claim 20.

34. A method for identifying the polypeptide of claim 15 which induces an immune response effective to prevent or lessen the severity of Chlamydia infection in a mammal previously immunized with polypeptide, comprising the steps of:

(a) immunizing a mouse with the polypeptide; and

(b) inoculating the immunized mouse with Chlamydia;

wherein the polypeptide which prevents or lessens the severity of Chlamydia infection in the immunized mouse compared to a non-immunized control mouse is identified.

35. An expression plasmid selected from the group consisting of pCACPNM555a, pCAI555 and pCAD76kDa.

36. A nucleic acid molecule selected from the group consisting of SEQ ID Nos: 1, 3, 5 and 7.

37. A polypeptide selected from the group consisting of SEQ ID Nos: 2, 4, 6 and 8.

38. An isolated 76kDa protein from *Chlamydia*.

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